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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/674,312	09/30/2003	Vivek Jain	JP920030093US1	9424

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FREDERICK W. GIBB, III
Gibb Intellectual Property Law Firm, LLC
2568-A RIVA ROAD
SUITE 304
ANNAPOLIS, MD 21401

EXAMINER

AHMED, AFFAF

ART UNIT	PAPER NUMBER
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3622

MAIL DATE	DELIVERY MODE
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09/16/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/674,312	JAIN ET AL.	
	Examiner	Art Unit	
	AFAF AHMED	3622	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE ____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) ____ is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. ____. |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____. |

DETAILED ACTION

Status of Claims

1. This action is in reply to the amendment filed on 6/22/2009.
2. Claims 29-33, 38, 43-45, 49-51 have been amended.
3. Claims 34-37, 39-42, 46-48 and 52-56 have been canceled.
4. Claims 29-33, 38, 43-45 and 49-51 are currently pending and have been examined.

Response to Applicant's Arguments

5. Applicant's amendments and arguments filed on 6/22/2009 have been fully considered, but they are not persuasive and discussed in the next section. Applicant is reminded that the claims must be given its broadest, reasonable interpretation.

6. With regard to claims 29, 43, 49:

- Applicant argues that *"Nowhere does Abe disclose, teach or suggest a randomization of actions to allow for explorations of other actions in a RL algorithm as does the present invention"*.

Examiner respectfully disagrees. Abe in at least paragraph 90 discloses the epsilon.-greedy method which employs the state space by employing a stochastic policy that chooses an action at random with probability. With reference to Wikipedia.org, please see "Multi-armed_bandit" for Multi for Epsilon-greedy strategy means. Additionally, as per Applicant's specification, "all the existing RL algorithm are variants of the above basic procedure (paragraph 90)" and "FIG. 4 is a flowchart depicting the reinforcement learning algorithm, as it exists in the art (paragraph 84)".

- Applicant argues that Abe does not disclose, teach or suggest at least the present invention's features of: *" recommending, by said computer, a set of possible marketing strategies to determine an optimal marketing strategy by using a modified RL algorithm"*.

Examiner respectfully disagrees. Abe in at least paragraphs 13 and 14 discloses a modified reinforcing learning algorithm. Abe in at least paragraph 19 discloses an inventive method that is applied to cross –channel optimized marketing by providing customer data including stimulus-response history data from a plurality of channels, integrating the customer data and automatically generating channel specific actionable rules based on customer data. For instance, in this case the method may optimize cross- channel cumulative profits. Abe also in paragraph 21 discloses automatically generating actionable rules that includes transforming an output of value function estimation into a set of actionable rules. Specifically, transforming may include a transformation

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model of the value function into a set of actionable rules, so as to output a set of if-then style rules that specify what action to take given a set of features values corresponding to a customer, and to specify an action that corresponds to the action with an approximately maximum value according to the value function for a given set of feature values. Furthermore, Abe in at least paragraph 90 discloses the epsilon.-greedy method which employs the state space by employing a stochastic policy that chooses an action at random with probability.

- Applicant argues that Mittal does not
 - a. *disclose, teach or suggest a randomization of actions to allow for explorations of other actions in a RL algorithm as does the present invention*”.
 - b. *disclose, teach or suggest recommending, by said computer, a set of possible marketing strategies to determine an optimal marketing strategy by using a modified RL algorithm*”.

Examiner respectfully disagrees. Mittal reference was used to address the limitation of: *inputting, to a computer by a merchant, said at least one specified merchant objective, said at least one specified merchant objective including said specified time period and said specified budget as constraints.*

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 29-33, 38, 43-45, 49, 50 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abe et al, US Pub No. 2004/0015386 in view of Mittal et al, US Pub No: 2004/0117239 A1.

Claims 29, 43 and 49:

Abe discloses:

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- *contacting said merchant by said customer, said customer having a customer profile stored in said computer, said customer profile including a history of interactions between said customer and said merchant, each of said interactions corresponding to a state of said customer (see at least paragraphs 11-14, 67, 152-157 and 167);*
- *generating, by said computer, possible marketing strategies, each of said possible marketing strategies comprising initiatives, which are deployed together in a given sequence each of said initiatives being associated with a marketing channel and being deployed for a variable time; wherein said initiatives include any of bundling of products, cross-sells, up-sells, coupons, discounts, promotions, advertisements, surveys, and customer feedback;*

See at least paragraphs 11-14, 179-181 and 186;

- *recommending, by said computer, a set of possible marketing strategies, along with a deployment probability of each of said set of possible marketing strategies to determine an optimal marketing strategy by using a modified Reinforcement Learning (RL) algorithm (see at least paragraphs 90-93);*
- *said contacting said merchant by said customer corresponds to a perception of said state based on said customer profile (see at least paragraphs 14, 19, 67, 167-170);*
- *said initiatives deployed by any of said possible marketing strategies correspond to actions (see at least paragraphs 14, 19, 67, 129 and 152) ;*
- *a total expected reward is estimated for all states and all actions corresponding to said possible marketing strategies, and estimating said total expected reward for all states and all actions comprises (see at least paragraphs 15,16, 31 and 79);*
- *for every state, identifying a specific action that gives a maximal value for a corresponding total expected reward; selecting another action corresponding to a randomization of deployment for said specific action (see at least paragraphs 67, 74-79 and 150);*
- *recording a total expected reward for execution of said another action and a resultant state resulting from the action of said another action: updating an estimated value of said total expected reward with the said total expected reward for execution of said another action and said resultant state,*

according to a discount factor (see at least paragraphs 79, 123, 150 and 153);

- *iteratively repeating said identifying a specific action, said selecting another action, said recording a total expected reward, and said updating an estimated value of said total expected reward, to determine a best value for said total expected reward that identifies said optimal marketing strategy (see at least paragraphs 14, 74-79 and 153-157);*
- *deploying, by said computer, said optimal market strategy to said customer; recording, by said computer, a response of said customer to said optimal market strategy in an updated customer profile (see at least paragraphs 152, 171 and 176);*
- *iteratively repeating, by said computer, said recommending a set of said possible marketing strategies along with a deployment probability of each of said set of said possible marketing strategies, said deploying said optimal market strategy, and said recording a response of said customer, while said time period, specified by said merchant, has not expired, otherwise stopping (see at least paragraphs 65, 67 and 152-156);*

Abe does not specifically disclose, but Mittal, however, discloses:

- *inputting to a computer, a merchant objective that is specified by a merchant, said merchant objective being associated with a time period (see at least paragraph 15);*

The combination of Abe/ Mittal discloses:

- *a total time of each of said possible marketing strategies being equal to a sum of all of said initiatives deployed,*
- *wherein said generating of said possible marketing strategies is subject to constraints of cost and a specified total time of each of said possible marketing strategies;*

Abe in at least paragraphs 12 and 122 discloses an invention of sequential decision making for customer relationship management on reinforcement learning framework to optimize a sequence of cost-sensitive decisions in order to maximize the total benefits occurred over time. Abe also in at least paragraph 122 discloses a time window that is used to summarize recent promotion -response behaviors, where only the last 16 of 22 campaigns were used for episode data. Furthermore, Abe in at least paragraph 185 and fig (18 and 19) with the associated text discloses an

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analytics for customer relationship management for optimizing targeted marketing across all channels for lifetime value maximization.

Mittal in at least paragraph 15 discloses any marketing research experiment has an associated budget, one or more target user segments and a time period for completion. the merchant desires to complete the experiment within the specified budget and within the defined time period to obtain the required information from one or more set of target users/customers. Mittal also in at least paragraph 46 discloses a mechanism for minimizing the cost and the total time required to complete the experiment. Furthermore, Mittal in at least paragraph 50 discloses flowchart specification of an experiment parameter by the merchant. The parameters comprise the time period for the experiment and the experiment budget.

It would have been obvious to one of ordinary skill in the art at the time of the invention to include in the reinforcement learning algorithm marketing strategy of Abe the ability to specify total time of each marketing strategy and budget/time constraints as taught by Mittal since the claimed invention is merely a combination of old elements, and in the combination each element merely would have performed the same function as it did separately, and one of ordinary skill in the art would have recognized that the results of (of providing the merchants with an optimal marketing strategy developed within a set budget and time period) the combination were predictable.

Claims 30, 44 and 50:

Abe/ Mittal disclose the limitations as shown above.

Abe further discloses:

- *selecting at least one initiative that enables an addressing of said objective;*
- *determining a sequence in which selected initiatives can be deployed, if more than one initiative is selected;*
- *combining the selected initiatives in the determined sequences to obtain said possible marketing strategies;*

See at least paragraphs 70, 176 and 199;

Claims 31 and 32:

Abe/ Mittal disclose the limitations as shown above.

Abe further discloses:

- *varying parameters of said selected initiatives to generate new initiatives corresponding to new states during said specified time period (see at least paragraphs 195-199);*
- *varying deployment time of said selected initiatives (see at least paragraphs 201 and 202);*

Claims 33, 38, 45 and 51:

Abe/ Mittal disclose the limitations as shown above.

Abe further discloses:

- *wherein determining an optimal marketing strategy further comprises constraints corresponding to marketing channels*
- *assigning customer's preferences for marketing channels, cost and effectiveness of different marketing channels, and the specified budget as effective constraints;*

See at least paragraphs 185.192-196 and fig 19 with the associated text;

Conclusion

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

10. A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS from the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX Months from the mailing date of this final.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Affaf Ahmed whose telephone number is 571-270-1835. The examiner can normally be reached on Monday - Friday, 8:30 am-6:00 pm est, alt Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eric Stamber can be reached at 571-272-6724. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

AA

/Yehdega Retta/

Primary Examiner, Art Unit 3622